

- Nominal voltage AC/DC 24 V
- Control MFT/programmable
- Communication via Belimo MP-Bus or conventional control
- Conversion of active sensor signals and switching contacts



5-year warranty

MP-BUS®



## Technical data

|                               |                                |                                                                          |
|-------------------------------|--------------------------------|--------------------------------------------------------------------------|
| <b>Electrical data</b>        | Nominal voltage                | AC/DC 24 V                                                               |
|                               | Nominal voltage frequency      | 50/60 Hz                                                                 |
|                               | Power consumption in operation | 8 W                                                                      |
| <b>Data bus communication</b> | Number of nodes                | Max. 32 (without repeater)                                               |
| <b>Functional data</b>        | Valve size [mm]                | 3" [80]                                                                  |
|                               | Operating range Y              | 2...10 V                                                                 |
|                               | Operating range Y note         | 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)                              |
|                               | Input Impedance                | 100 kΩ (0.1 mA), 500 Ω                                                   |
|                               | Options positioning signal     | VDC variable                                                             |
|                               | Position feedback U            | 2...10 V                                                                 |
|                               | Position feedback U variable   | VDC variable                                                             |
|                               | Running Time (Motor)           | 90 s                                                                     |
|                               | Running time fail-safe         | <35 s                                                                    |
|                               | Sound power level Motor        | 45 dB(A)                                                                 |
|                               | Noise level, fail-safe         | 45 dB(A)                                                                 |
|                               | Control accuracy               | ±5%                                                                      |
|                               | Min. controllable flow         | 1% of V'nom                                                              |
|                               | Fluid                          | chilled or hot water, up to 60% glycol max (open loop/steam not allowed) |
|                               | Fluid Temp Range (water)       | 14...250°F [-10...120°C]                                                 |
|                               | Close-off pressure Δps         | 310 psi                                                                  |
|                               | Differential Pressure Range    | 5...50 psi or 1...50 psi see flow reductions chart in tech doc           |
|                               | Flow characteristic            | equal percentage or linear                                               |
|                               | Body Pressure Rating           | ANSI Class 250, standard class B, raised-face                            |
|                               | GPM                            | 180                                                                      |
|                               | Servicing                      | maintenance-free                                                         |
|                               | Manual override                | external push button                                                     |
| <b>Flow measurement</b>       | Measuring accuracy flow        | ±2%*                                                                     |
|                               | Measurement Repeatability      | ±0.5% (Flow)                                                             |
|                               | Sensor Technology              | Ultrasonic with glycol and temperature compensation                      |
| <b>Safety data</b>            | Degree of protection IEC/EN    | IP54                                                                     |
|                               | Degree of protection NEMA/UL   | NEMA 2                                                                   |
|                               | Enclosure                      | UL Enclosure Type 2                                                      |

|             |                     |                                                                                                                                                                                                              |
|-------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety data | Agency Listing      | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC |
|             | Quality Standard    | ISO 9001                                                                                                                                                                                                     |
|             | Ambient temperature | -22...122°F [-30...50°C]                                                                                                                                                                                     |
|             | Storage temperature | -40...176°F [-40...80°C]                                                                                                                                                                                     |
|             | Ambient humidity    | Max. 95% RH, non-condensing                                                                                                                                                                                  |
| Materials   | Valve body          | Cast iron - GG 25                                                                                                                                                                                            |
|             | Flow measuring pipe | Ductile cast iron - GGG50                                                                                                                                                                                    |
|             | Spindle             | stainless steel                                                                                                                                                                                              |
|             | Spindle seal        | EPDM (lubricated)                                                                                                                                                                                            |
|             | Characterized disc  | stainless steel                                                                                                                                                                                              |
|             | Seat                | PTFE                                                                                                                                                                                                         |
|             | Pipe connection     | pattern to mate with ANSI 250 flange                                                                                                                                                                         |
|             | O-ring              | EPDM (lubricated)                                                                                                                                                                                            |
|             | Ball                | stainless steel                                                                                                                                                                                              |

## Safety notes



- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insulation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorized specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

## Product features

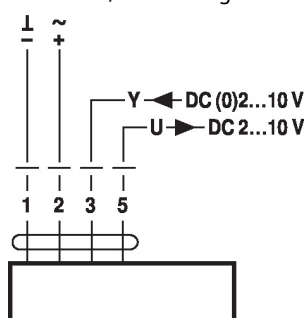
**Flow measurement** \*All flow tolerances are at 68°F [20°C] & water.

## Accessories

| Electrical accessories | Description                                                                                                                           | Type      |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                        | Replacement flow sensor for EPIV, electromagnetic                                                                                     | EPIVFS-60 |
|                        | Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US    |

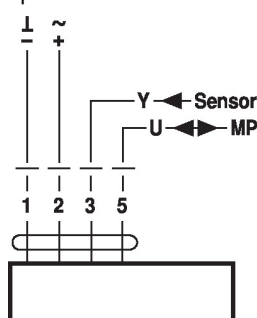
## Electrical installation

AC/DC 24 V, modulating



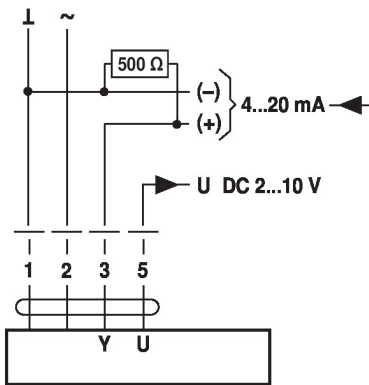
**Cable colors:**  
 1 = black  
 2 = red  
 3 = white  
 5 = orange

Operation on the MP-Bus



**Cable colors:**  
 1 = black  
 2 = red  
 3 = white  
 5 = orange

Control with 4...20 mA via external resistor

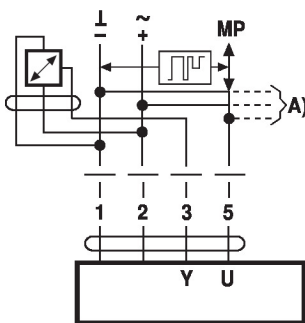


### Caution:

The operating range must be set to DC 2...10 V.

The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

Connection of active sensors



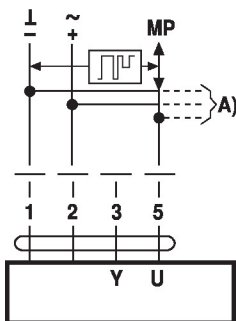
A) additional MP-Bus nodes (max. 8)

- Supply AC/DC 24 V
- Output signal DC 0...10 V (max. DC 0...32 V)
- Resolution 30 mV

## Functions

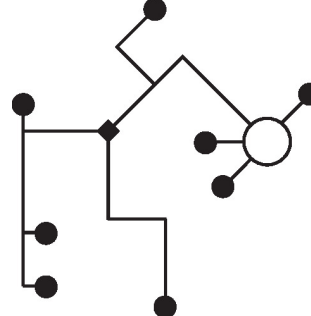
### Functions when operated on MP-Bus

Connection on the MP-Bus



A) additional MP-Bus nodes (max. 8)

MP-Bus Network topology



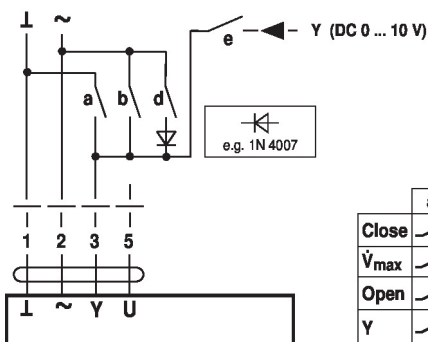
There are no restrictions for the network topology (star, ring, tree or mixed forms are permitted).

Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- no terminating resistors required

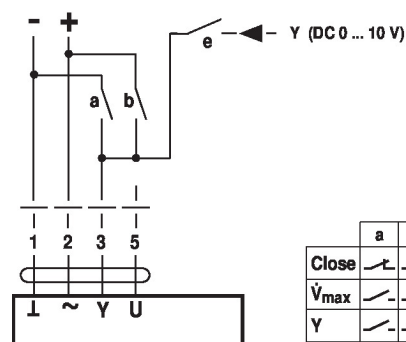
### Functions with specific parameters (Parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts



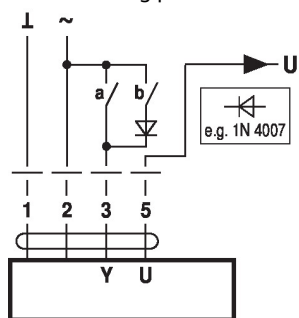
|                  | a | b | d | e |
|------------------|---|---|---|---|
| Close            | ✓ | ✓ | ✓ | ✓ |
| V <sub>max</sub> | ✓ | ✓ | ✓ | ✓ |
| Open             | ✓ | ✓ | ✓ | ✓ |
| Y                | ✓ | ✓ | ✓ | ✓ |

Override control and limiting with DC 24 V with relay contacts



|                  | a | b | d | e |
|------------------|---|---|---|---|
| Close            | ✓ | ✓ | ✓ | ✓ |
| V <sub>max</sub> | ✓ | ✓ | ✓ | ✓ |
| Y                | ✓ | ✓ | ✓ | ✓ |

Control floating point

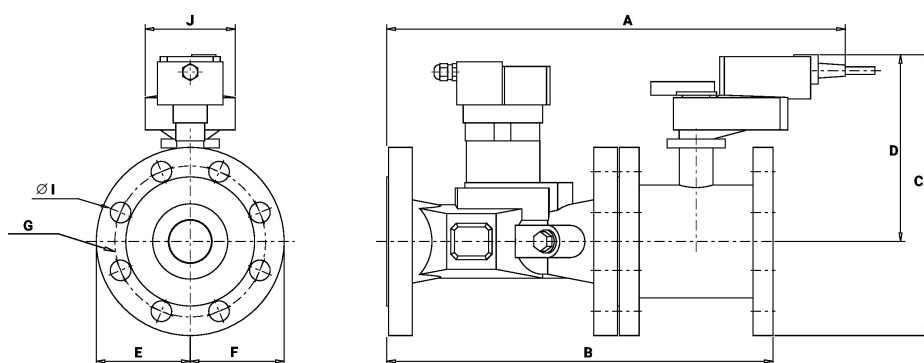


Position control:  $90^\circ = 100s$

Flow control:  $V_{max} = 100s$

## Dimensions

Dimensional drawings



| A           | B           | C           | D          | E          | F          | G          | I         | J        |
|-------------|-------------|-------------|------------|------------|------------|------------|-----------|----------|
| 20.3" [515] | 17.0" [433] | 12.3" [312] | 8.2" [208] | 4.1" [105] | 4.1" [105] | 6.6" [168] | 0.9" [22] | 4" [102] |